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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,999	07/13/2006	Hisayuki Miki	Q81612	1177

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EXAMINER	
MONTALVO, EVA Y	

ART UNIT	PAPER NUMBER
2814	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,999	MIKI ET AL.	
	Examiner	Art Unit	
	Eva Montalvo	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-23* is/are pending in the application.

4a) Of the above claim(s) *14 and 20-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/13/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action responds to the election filed on 12/04/2008.

Election/Restrictions

2. Applicant's election without traverse of Group II, reading on claims 15-19 filed on 07/13/2006 is acknowledged and entered into the record. Claims 14, and 20-23 are withdrawn from further consideration pursuant to 37 CFR 1.142 (b), as being drawn to the nonelected group.

Claim Objections

3. Claims 15 and 19 are objected to because of the following informalities:

a. In claim 15, line 8, "the nitrogen source at 700 to 950°C" should read -- the nitrogen source at 700°C to 950°C-- to clarify the claim languge.

b. In claim 19, line 2, "the reduction is 0.001 to 10%" should read -- the reduction is 0.001% to 10%-- to clarify the claim language.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 15 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 15 recites the limitation "the flow rate" in lines 6-7. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 18 recites the limitation "the carrier gas employed during growth" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 19 recites the limitation "the flow rate" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 15-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Kobayakawa (US 2007/0090369 and Kobayakawa hereinafter).

Kobayakawa discloses a production method of semiconductor device comprises, during lowering temperature after completion of growth of the p-type contact layer composed of AlGaN containing a p-type dopant, immediately after the completion of the growth, starting, at a temperature at which the growth has completed, supply of a carrier gas composed of an inert gas and reduction of the flow rate of a nitrogen source; and stopping supply of the nitrogen source at 700 to 950°C in the course of lowering temperature (see abstract and [0029]-[0034]).

As to claims 16-18, Kobayakawa discloses a method, where the temperature when the growth has been completed is 900°C or higher (see [0030]); the nitrogen source is ammonia gas

(see [0029]); and the carrier gas employed during growth of the semiconductor contains hydrogen gas (see [0029]).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiura (US 6,015,979 and Sugiura hereinafter) in view of Nidou et al. (JP 09-199758 and Nidou hereinafter).

Sugiura discloses a production method of semiconductor device comprises, during lowering temperature after completion of growth of the p-type contact layer composed of AlGaN containing a p-type dopant, immediately after the completion of the growth, starting, at a temperature at which the growth has completed, supply of a carrier gas composed of an inert gas

and reduction of the flow rate of a nitrogen source; and stopping supply of the nitrogen source in the course of lowering temperature (see col. 13, lines 32-50).

Although the device disclosed by Sugiura shows substantial features of the claimed invention, it fails to expressly teach a method where the temperature for stopping the supply of nitrogen source is at 700 to 950°C.

Nonetheless, these features are well known in the art and would have been an obvious modification of the device disclosed by Sugiura, as evidenced by Nidou.

Nidou discloses a method, where the temperature for stopping the supply of nitrogen source is at 700 to 950°C (see abstract and [0029]).

Since Sugiura and Nidou are in the same filed of endeavor, a person having ordinary skill in the art at the time of invention would have readily recognized the desirability and advantages of modifying Sugiura, as suggested by Nidou, by stopping the supply of nitrogen source at 700 to 950°C in course of lowering the temperature. This would prevent hydrogen gas from diffusing out from the crystal surface, thereby obtaining a low resistance p-type layer (see [0030]).

As to claim 19, Sugiura teaches an ammonia flow rate of 31.6% with respect of the total volume of gas (i.e., ammonia flow rate 9.5 L/min and a nitrogen carrier gas flow rate of 20.5L/min) in col. 13, lines 45-48. Although Sugiura in view of Nidou fail to disclose that the flow rate of the nitrogen source after the reduction is 0.001 to 10% with respect to the flow rate of the total volume of gas, Applicant has not disclosed that the range of the impurity concentration is for a particular unobvious purpose, produces an unexpected result, or is otherwise critical. It has been held that percentage range differences will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating

such distance range is critical. "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the workable ranges by routine experimentation". *In re Aller,* 220 F.2d 454,456,105 USPQ 233, 235 (CCPA 1955).

Since the applicants have not established the criticality (see paragraph 14) of the percentage range claimed, it would have been obvious to one of ordinary skill in the art to use the value in the method of Sugiura.

CRITICALITY

14. The specification contains no disclosure of either the critical nature of the claimed percentage range or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff,* 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Montalvo whose telephone number is (571)270-3829. The examiner can normally be reached on Monday through Thursday 7:30-5:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marcos D. Pizarro-Crespo can be reached on (571)272-1716. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Eva Montalvo
Patent Examiner
Art Unit 2814

/Marcos D. Pizarro/
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